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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/755,034	01/08/2004	Ming H. Wu	MEM-0003-P	7883
23413	7590	11/27/2006	EXAMINER	
CANTOR COLBURN, LLP			MORILLO, JANEL COMBS	
55 GRIFFIN ROAD SOUTH			ART UNIT	PAPER NUMBER
BLOOMFIELD, CT 06002			1742	

DATE MAILED: 11/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/755,034

Applicant(s)

WU, MING H.

Examiner

Janelle Combs-Morillo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 08 September 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-49 is/are pending in the application.
- 4a) Of the above claim(s) 26-49 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>3/3/2006</u> | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on September 8, 2006 has been entered.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schetky et al (US 6,258,182).

Schetky broadly teaches a beta phase titanium alloy preferably comprising: 10-12% Mo, 2.8-4% Al, 0-2% Cr, and 0-4% Nb (see abstract), which meets or touches the boundary of the presently claimed ranges of Mo, Al, Cr, and Nb. Said range taught by Schetky includes 0% Cr, which meets the instant amended limitation of "devoid of chromium". Schetky teaches said alloy has a beta phase (abstract), has linear elastic properties (column 4 line 16), pseudo elastic properties (column 3 line 14), superelastic properties (column 3 lines 27-28), and has a martensitic structure (abstract). Overlapping ranges have been held to be a prima facie case of

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obviousness, see MPEP § 2144.05. It would have been obvious to one of ordinary skill in the art to select any portion of the range, including the claimed range, from the broader range disclosed in the prior art, because the prior art finds that said composition in the entire disclosed range has a suitable utility. Because Schetky teaches overlapping ranges of a Ti alloy with a  $Mo_{eq}$  amount that falls within the instant range, and wherein said alloy exhibits superelastic and pseudo elastic properties, it is held that Schetky has created a prima facie case of obviousness of the presently claimed invention.

Concerning the process limitations of independent claim 2, Schetky teaches cold working a wire up to 20% reduction and heat treating at typically 780-880°C (column 8 lines 36-40), which meets the presently claimed product by process limitations.

Concerning claim 3, the alloy taught by Schetky meets the presently claimed relationship, as determined by the instant the equation for said  $Mo_{eq}$  in claim 3 (see above reference to example 28).

While the preferred range taught by Schetky does not overlap the alloy of claim 4, the alloy of claim 4 falls within the scope of the limits of Mo, Al, Cr, V, and Nb listed in the examples of Schetky in Table III columns 7 and 8, wherein said examples encompass: 8.4-12% Mo, 2.3-3.7% Al, 0-1.8% Cr, 0-1.8% V, 0-3.8% Nb.

Concerning the process limitations of product by process claims 5-8, Schetky teaches cold working a wire up to 20% reduction, further heat treatment including solution heat treating 780-880°C for typically 30 minutes (column 12 line 60), which overlaps the presently claimed heat treatment time and temperatures. Said solution heat treatment temperature taught by Schetky overlaps heating above the beta transus. Though Schetky does not teach a product

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produced by solution heating below the beta transus, the temperature range of solution heating given by Schetky overlaps the solution heat treatment range given in the instant specification typical of below the transus temperature (see [0056]).

Concerning claim 9, as stated above, Schetky teaches a beta phase titanium alloy preferably comprising: 10-12% Mo, 2.8-4% Al, 0-2% Cr, and 0-4% Nb (see abstract).

Concerning claims 10-16, Schetky teaches ex. 28 exhibits a 3% elastic spring back (Table 3) when loaded to 4% strain at room temperature (column 3 lines 19-21), which meets the elastic recovery limitation of claims 12 and 13. Concerning the elastic recovery and elastic modulus limitations of claims 10, 11, 14-16, because Schetky teaches a substantially overlapping alloy composition, processed in a substantially similar method, then substantially the same properties, such as elastic recovery and elastic modulus are inherently present. Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). "When the PTO shows a sound basis for believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not." *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990). Therefore, if the prior art teaches the identical chemical structure, the properties applicant discloses and/or claims are necessarily present.

Concerning claims 17-23, because Schetky teaches a substantially overlapping alloy composition, processed in a substantially similar method, then substantially the same properties, such as elastic recovery is expected to be present. Where the claimed and prior art products are

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identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). "When the PTO shows a sound basis for believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not." *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990). Therefore, if the prior art teaches the identical chemical structure, the properties applicant discloses and/or claims are necessarily present.

Concerning claim 24, Schetky teaches said alloy is manufactured into a variety of useful articles, such as medical devices (abstract).

Concerning claim 25, Schetky teaches said alloy is manufactured into a variety of useful articles, such as medical devices (abstract).

4. Claims 1-3, 9-16, 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP'241 or Sagoi.

JP'241 teaches examples of a Ti alloy within the instant  $Mo_{eq}$  range of instant claim 1 (JP'241 at Table I): alloy A ( $Mo_{eq}=8.82$ ), D ( $Mo_{eq}=10$ ), E ( $Mo_{eq}=10.32$ ), I ( $Mo_{eq}=9.68$ ), N ( $Mo_{eq}=9.72$ ), wherein said alloy comprises: 2-5% Al, 1-9% Mo, 6.1-9.0% Cr, balance Ti (abstract). Said examples of JP'241 do contain Cr, however, the role of Cr is to contribute to the  $Mo_{eq}$ , and the absence of Cr does not appear to be critical (see prior art, instant specification). Because additive elements Nb, Cr, etc are held to stabilize the beta phase and contribute to the  $Mo_{eq}$  in a substantially similar way, it would have been obvious to replace Cr with Nb, because it is prima facie obvious to substitute equivalents known for the same purpose, see MPEP 2144.06.

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Sagoi teaches a Ti based alloy comprising 2-5% Al, 1-9% Mo, 6.1-9% Cr, balance Ti (abstract). Sagoi further teaches examples in Table 1 within the presently claimed  $Mo_{eq}$  range of instant claim 1 (Sagoi at Table I) including example 10 ( $Mo_{eq}=10.16$ ). Sagoi teaches heat treating and working said alloys to form a  $\beta$  phase structure, or an  $\alpha+\beta$  phase structure (column 2 lines 39-55). Said examples of Sagoi contain Cr, however, it would have been obvious to replace Cr with Nb, because it is prima facie obvious to substitute equivalents known for the same purpose.

Though neither JP'241 nor Sagoi teach said alloy is superelastic or pseudo elastic, because the alloys taught by the prior art substantially overlap the presently claimed  $Mo_{eq}$  and are processed in a substantially similar heat treating method, then substantially the same properties, such as elasticity are expected to occur for JP'241 or Sagoi, as in the instant invention. Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). Therefore, if the prior art teaches the identical chemical structure, the properties applicant discloses and/or claims (such as superelastic or pseudo elastic behavior) is necessarily present.

Because the prior art teaches examples within the presently claimed alloying ranges, and wherein said prior art alloy appears to be substantially identical to the presently claimed alloy product, it is held that JP'241 or Sagoi anticipates, or on the alternative, has created a prima facie case of obviousness, of the presently claimed invention.

Concerning the instant product by process limitations for claim 2 as well as the phase

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structure of claim 9, JP'241 teaches heating to ~800°C (see Table 1). Sagoi teaches solution heating 760-800°C to achieve a beta phase structure or alpha + beta (column 2 lines 39-45).

Neither JP'241 nor Sagoi teach cold working (which is optional in instant claim 2). However, with regard to the process step of cold working, it is well settled that a product-by-process claim defines a product, and that when the prior art discloses a product substantially the same as that being claimed, differing only in the manner by which it is made, the burden falls to applicant to show that any process steps associated therewith result in a product materially different from that disclosed in the prior art. See MPEP 2113, *In re Brown* (173 USPQ 685) and *In re Fessman* (180 USPQ 524) *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). Once the examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. *In re Marosi*, 710 F.2d 798, 802, 218 USPQ 289, 292.

Concerning claim 3, the alloy taught by JP'241 or Sagoi meets the presently claimed relationship, as determined by the instant the equation for said  $Mo_{eq}$  in claim 3 (see above reference to examples of JP'241 or Sagoi).

Concerning claims 10-16, because JP'241 or Sagoi teaches a substantially overlapping alloy composition, processed in a substantially similar method, then substantially the same properties, such as elastic recovery are inherently present (see above discussion).

Concerning claim 24, JP'241 teaches said alloy can be made into various articles such as a steam turbine blade (abstract). Sagoi also teaches said alloy can be made into turbine blades (abstract).



*Response to Amendment/Arguments*

5. In the response filed on September 8, 2006, applicant amended claim 1 and submitted various arguments traversing the rejections of record. The examiner agrees that applicant has overcome the 112 first paragraph rejection, and that the instant amendment introduces no new matter.

6. Applicant's argument that the present invention is allowable over the prior art of record because the prior art does not teach a Ti-Mo-Al alloy with the presently claimed alloying ranges, as well as being "devoid of chromium" has not been found persuasive. As stated in the rejections above, Sagoi and JP'241 teach alloys containing Cr, however, the role of Cr is to contribute to the Mo<sub>eq</sub>, and the absence of Cr does not appear to be critical (see prior art, instant specification). Because additive elements Nb, Cr, etc are held to stabilize the beta phase and contribute to the Mo<sub>eq</sub> in a substantially identical way, it would have been obvious to replace Cr with Nb, because it is prima facie obvious to substitute equivalents known for the same purpose, see MPEP 2144.06.

7. Applicant's argument that the present invention is allowable over the prior art of record because Schetky does not teach examples within the claimed ranges/Schetky teaches against the present invention has not been found persuasive. Patents are relevant as prior art for all they contain, and nonpreferred embodiments constitute prior art, MPEP 2123. Disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or nonpreferred embodiments. In re Susi, 440 F.2d 442, 169 USPQ 423 (CCPA 1971). "A known or obvious composition does not become patentable simply because it has been described as

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somewhat inferior to some other product for the same use." In re Gurley, 27 F.3d 551, 554, 31 USPQ2d 1130, 1132 (Fed. Cir. 1994).

Though Schetky teaches preferred embodiments with an amount of Mo that is higher than the maximum of 9.75% Mo in claim 4, Schetky also teaches examples with Mo contents within the instant range can still exhibit beneficial elastic spring back and a small amount of shape memory recovery (Table III). Though Schetky teaches the elastic spring back for alloys with lower Mo is expected to be less than the elastic spring back for alloys with higher, it is unclear how/if Applicant's alloy exhibits unexpected results with respect to the lower Mo alloys taught by the prior art.

8. Applicant's argument that the present invention is allowable over the prior art of record because JP'241 or Sagoi fail to teach or suggest the presently claimed alloy with superelastic properties and/or Mo<sub>eq</sub> must be in the form of a declaration to be of probative value. Objective evidence which must be factually supported by an appropriate affidavit or declaration to be of probative value includes evidence of unexpected results, commercial success, solution of a long-felt need, inoperability of the prior art, invention before the date of the reference, and allegations that the author(s) of the prior art derived the disclosed subject matter from the applicant. See, for example, *In re De Blauwe*, 736 F.2d 699, 705, 222 USPQ 191, 196 (Fed. Cir. 1984). MPEP 716.01(c).

9. Applicant's argument that the present invention is allowable over the prior art of record because Schetky teaches high amounts of Cr are needed for pseudo-elastic strain recovery for alloys that comprise  $\leq 10\%$  Mo, because alloys #27, 28, 29, and 36 exhibit high elastic recovery and contain at least 1.4% Cr has not been found persuasive. As stated above, because additive

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elements Nb, Cr, etc are held to stabilize the beta phase and contribute to the Mo<sub>eq</sub> in a substantially identical way, it would have been obvious to replace Cr with Nb, because it is prima facie obvious to substitute equivalents known for the same purpose, see MPEP 2144.06. Additionally, example #42, which contains 10.2% Mo which qualifies as "about 10% Mo", contains 0% Cr and exhibited significant pseudo-elastic strain recovery of 3.7% (Table III).

Applicant has not clearly shown specific unexpected results with respect to the overlapping composition taught by the prior art or criticality of the instant claimed range- such as unexpected strain recovery or shape memory recovery, etc. (wherein said results must be fully commensurate in scope with the instantly claimed ranges, see MPEP 716.02 d).

### ***Double Patenting***

10. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

11. Claims 1, 3-25 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-52 of copending Application No. 10/609004. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of US'004 are also drawn to a

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composition with 8-10% Mo, 2.8-6% Al, up to 2% V, up to 4% Nb, balance Ti; wherein said alloy is produced by solution heating, cold working, cooling in air (US'004 at cl. 2, 39, 43). The  $Mo_{eq}$  of said alloy taught by the claims of US'004 meets the  $Mo_{eq}$  given in instant claims 1 and 3.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

12. Claims 1-25 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 15-20, 23, 24 of copending Application No. 10/869359. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of US'359 are drawn to an overlapping alloy composition with 8-12% Mo, 2.8-6% Al, up to 2% V, up to 4% Nb, balance Ti (US'359 at cl. 17), wherein said alloy is produced an identical process of heat treating and cold working (US'359 at cl. 15, 18). The  $Mo_{eq}$  of said alloy taught by claims 15, 16, 18, and 19 of US'359 meets the  $Mo_{eq}$  given in instant claims 1 and 3.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

13. Claims 1-25 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-25 of copending Application No. 10/609003. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of US'003 are drawn to an overlapping alloy composition with 8-10% Mo, 2.8-6% Al, up to 2% V, up to 4% Nb, balance Ti (US'003 at cl. 1), wherein said alloy is produced a process of heat treating and cold working (US'003 at cl.

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2, 12). The  $Mo_{eq}$  of said alloy taught by the alloy of claims of US'003 meets the  $Mo_{eq}$  given in instant claims 1 and 3.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

14. Claims 1-25 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-6, 8-55 of copending Application No. 10/755085. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of US'085 are drawn to an overlapping alloy composition with 8-10% Mo, 2.8-6% Al, up to 2% V, up to 4% Nb, balance Ti (US'085 at cl. 3), produced an identical process of solution heating, cold working, cooling in air, aging 350-550°C (US'085 at cl. 4, 45). The  $Mo_{eq}$  of said alloy taught by the alloy of claims of US'085 meets the  $Mo_{eq}$  given in instant claims 1 and 3.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

### ***Conclusion***

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Janelle Combs-Morillo whose telephone number is (571) 272-1240. The examiner can normally be reached on 8:30 am- 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
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JCM

November 14, 2006